



# JACC

## Cardiovascular Interventions

JANUARY 25, 2016

VOLUME 9

NUMBER 2

*A Journal of the American College of Cardiology***INSIDE THIS ISSUE****CLINICAL RESEARCH****CORONARY****Thrombus Aspiration in Patients With ST-Segment Elevation Myocardial Infarction Presenting Late After Symptom Onset****113**

Steffen Desch, Thomas Stiermaier, Suzanne de Waha, Philipp Lurz, Matthias Gutberlet, Marcus Sandri, Norman Mangner, Enno Boudriot, Michael Woinke, Sandra Erbs, Gerhard Schuler, Georg Fuernau, Ingo Eitel, Holger Thiele

It is unclear whether routine manual thrombus aspiration reduces microvascular obstruction (MVO) in patients with subacute ST-segment elevation myocardial infarction (STEMI). A total of 152 patients with STEMI presenting 12 to 48 h after symptom onset were randomized to primary percutaneous coronary intervention (PCI) with or without thrombus aspiration. The primary endpoint, extent of MVO assessed by cardiac magnetic resonance imaging, was not significantly different between groups. Routine thrombus aspiration before PCI thus failed to show a benefit for reperfusion success in patients with STEMI presenting late after symptom onset.

**■ EDITORIAL COMMENT****The Oculothrombotic Reflex: Why We Will Never Stop Aspiring Coronary Thrombi****123**

James C. Blankenship

**Outcomes From Selective Use of Thrombectomy in Patients Undergoing Primary Percutaneous Coronary Intervention for ST-Segment Elevation Myocardial Infarction: An Analysis of the British Cardiovascular Intervention Society/National Institute for Cardiovascular Outcomes Research (BCIS-NICOR) Registry, 2006-2013****126**

Alex Sirker, Mamas Mamas, Chun Shing Kwok, Evangelos Kontopantelis, Peter Ludman, David Hildick-Smith, on behalf of the British Cardiovascular Intervention Society (BCIS)

The impact of coronary thrombectomy on mortality in ST-segment elevation myocardial infarction (STEMI) is not definitively established. The U.K. national registry, therefore, was used to study 98,176 patients treated with primary percutaneous coronary intervention. Patients were grouped by whether they received thrombectomy or not, based on physician selection. The use of thrombectomy was not associated with any significant difference in mortality at 30 days or 1 year, using statistical modeling, even in the "simple" (manual aspiration) thrombectomy subgroup. Findings are consistent with the lack of clinical benefits in recent large randomized controlled trials of routine aspiration thrombectomy in STEMI.

**SEE ADDITIONAL CONTENT ONLINE****■ EDITORIAL COMMENT****The Rise and Fall of Aspiration Thrombectomy****135**

Dharam J. Kumbhani, Anthony A. Bavry



Articles with this symbol are accompanied by videos. Please go to [www.jacc-interventions.org](http://www.jacc-interventions.org) to view.

**Benefits and Risks of Extended Dual Antiplatelet Therapy After Everolimus-Eluting Stents****138**

James B. Hermiller, Mitchell W. Krucoff, Dean J. Kereiakes, Stephan Windecker, P. Gabriel Steg, Robert W. Yeh, David J. Cohen, Donald E. Cutlip, Joseph M. Massaro, Wen-Hua Hsieh, Laura Mauri, on behalf of the DAPT Study Investigators

The authors examined outcomes, post-hoc, among 4,703 randomized everolimus-eluting stent (EES)-treated subjects in the DAPT (Dual Antiplatelet Therapy) study. Among EES-treated patients, continued thienopyridine reduced stent thrombosis (0.3% vs. 0.7%;  $p = 0.04$ ) and myocardial infarction (MI) (2.1% vs. 3.2%;  $p = 0.01$ ) versus placebo, but not a composite of death, MI, or stroke (4.3% vs. 4.5%;  $p = 0.42$ ) and increased moderate/severe bleeding (2.5% vs. 1.3%;  $p = 0.01$ ) 12 to 30 months post-stenting. These outcomes were consistent among EES and other drug-eluting stents (interaction  $p = 0.76$  stent thrombosis;  $p = 0.11$  MI;  $p = 0.46$  bleeding). In EES-treated subjects, continued thienopyridine plus aspirin beyond 1 year (vs. aspirin alone) reduced stent thrombosis and MI and increased bleeding.

[SEE ADDITIONAL CONTENT ONLINE](#)**EDITORIAL COMMENT****Is Prolonged DAPT Apt or a Study in Zero-Sum Games?****148**

David R. Holmes, Jr., Charanjit S. Rihal

**STRUCTURAL****Effects of Mechanical Ventilation on Heart Geometry and Mitral Valve Leaflet Coaptation During Percutaneous Edge-to-Edge Mitral Valve Repair****151**

Johannes Patzelt, Yingying Zhang, Peter Seizer, Harry Magunia, Andreas Henning, Veronika Riemlova, Tara A.E. Patzelt, Marc Hansen, Michael Haap, Reimer Riessen, Henning Lausberg, Tobias Walker, Joerg Reutershan, Christian Schlensak, Christian Grasshoff, Dan I. Simon, Peter Rosenberger, Juergen Schrieck, Meinrad Gawaz, Harald F. Langer

Mechanical ventilation during percutaneous mitral valve repair (PMVR) allows modification of heart geometry. In 50 patients undergoing PMVR, increasing positive end-expiratory pressure levels resulted in a significant reduction of left ventricular and mitral valve annulus diameter. Accordingly, the authors observed a very robust amplification in mitral valve leaflet coaptation length. This increase in coaptation length was more pronounced in mitral regurgitation with functional or mixed genesis. Importantly, a coaptation length  $\geq 4.9$  mm was associated with significantly reduced PMVR procedure time. In conclusion, we describe a novel ventilation maneuver to amplify mitral valve coaptation length, which potentially facilitates the PMVR procedure.



### **Incidence, Predictive Factors, and Effect of Delirium After Transcatheter Aortic Valve Replacement**

**160**

Masieh Abawi, Freek Nijhoff, Pierfrancesco Agostoni, Marielle H. Emmelot-Vonk, Rehana de Vries, Pieter A. Doevendans, Pieter R. Stella

Patients undergoing surgical valve replacement appear at higher risk of post-operative delirium (POD). Little is known regarding the effect of POD on the clinical outcomes after transcatheter aortic valve replacement (TAVR). By means of this single-center retrospective study, the authors sought to investigate the incidence, predictive factors, and effect of POD among 268 consecutive patients treated with TAVR. The incidence of POD after TAVR was 13.4%. Nontransfemoral approach, current smoking, carotid artery disease, atrial fibrillation, and age were found to be independent predictors of POD. In addition, POD was associated with prolonged in-hospital stay and poorer midterm outcomes.

[SEE ADDITIONAL CONTENT ONLINE](#)

#### ■ EDITORIAL COMMENT

### **Could a "Simplified" Transcatheter Aortic Valve Replacement Procedure Eliminate Post-Operative Delirium?**

**169**

David A. Wood

### **Cerebral Protection During MitraClip Implantation: Initial Experience at 2 Centers**

**171**

Christian Frerker, Michael Schlüter, Oscar D. Sanchez, Sebastian Reith, Maria E. Romero, Elena Ladich, Jörg Schröder, Tobias Schmidt, Felix Kreidel, Michael Joner, Renu Virmani, Karl-Heinz Kuck

Stroke has been observed, if rarely, after MitraClip therapy. Using cerebral protection with a dual-filter system during MitraClip implantation revealed embolic debris potentially conducive to cerebrovascular events in all 14 patients studied. Most prevalent debris types were acute thrombus, foreign material likely originating from the hydrophilic device coating, and valve/atrial wall tissue. No strokes, transient ischemic attacks, or deaths occurred during 8.4 months (median) of follow-up observation. Our findings warrant further study to assess the impact of cerebral protection on the incidence of cerebrovascular events after MitraClip therapy.

#### ■ EDITORIAL COMMENT

### **Cerebral Embolic Protection in Catheter-Based Mitral Interventions: Research or Clinical Tool?**

**180**

Nicolas M. Van Mieghem, Lennart van Gils

**PERIPHERAL****Endovascular Repair of Acute and Chronic Aortic Type B Dissections:  
Main Factors Affecting Aortic Remodeling and Clinical Outcome****183**

Fabrizio Fanelli, Alessandro Cannavale, Gerard J. O'Sullivan, Marianna Gazzetti,  
Carlo Cirelli, Pierleone Lucatelli, Mariangela Santoni, Carlo Catalano

Morphological aortic remodeling after thoracic endovascular aortic repair (TEVAR) for type B aortic dissection may be linked to the clinical outcome and endoleak development. The authors postulated that some procedural factors could affect the clinical outcome, major adverse events (MAE), and frequency of the development of endoleaks. Some procedural factors were found to influence aortic remodeling and clinical outcomes in acute aortic dissection, but not in chronic aortic dissection. In particular, post-dilation of the stent graft augmented the false lumen (FL) thrombosis, without affecting or influencing MAEs or endoleak development, and left subclavian artery embolization had a direct influence on the improvement of FL thrombosis and reduced endoleak development but not MAE ( $p = 0.05$ ). These new findings may help to predict aortic remodeling and clinical outcome after TEVAR.

**■ EDITORIAL COMMENT****Thoracic Endovascular Aortic Repair in Acute and Chronic Type B Aortic Dissection****192**

Santi Trimarchi, Kim A. Eagle

**IMAGES IN  
INTERVENTION****Severe Prinzmetal-Type Coronary Artery Spasm Causing Recurrent  
ST-Segment Elevation and Reversible Obstruction of a Bioresorbable Scaffold****195**

Tommaso Gori, Udo Sechtem, Thomas Münzel

**Early Edwards SAPIEN Valve Degeneration After Transcatheter Aortic Valve Replacement****198**

Brahim Harbaoui, Pierre-Yves Courand, Zoé Schmitt, Fadi Farhat, Raphael Dauphin,  
Pierre Lantelme

**■ ONLINE FEATURE Very Late Restenosis After Bioresorbable Scaffold Implantation  
Due to Simultaneous External Compression of the Scaffold and Intrasccaffold  
Tissue Growth****e15**

Akihito Tanaka, Neil Ruparelia, Hiroyoshi Kawamoto, Azeem Latib, Antonio Colombo

**■ ONLINE FEATURE Retrograde Approach in Balloon Pulmonary Angioplasty:  
Useful Novel Strategy for Chronic Total Occlusion Lesions in Pulmonary Arteries****e19**

Takashi Kawakami, Masaharu Kataoka, Takahide Arai, Ryo Yanagisawa,  
Yuichiro Maekawa, Keiichi Fukuda

**■ ONLINE FEATURE Digital Gangrene Following Transradial Coronary Angiogram****e21**

Kuljit Singh, Joseph Abunassar, Derek Y.F. So

**■ ONLINE FEATURE Coronary Artery Aneurysm After Everolimus-Eluting  
Bioabsorbable Vascular Scaffold Implantation****e23**

Swaroop Varghese, Bernward Lauer, Marc-Alexander Ohlow

**■ ONLINE FEATURE THESE ARTICLES DO NOT APPEAR IN THE PRINTED ISSUE.  
THEY ARE AVAILABLE IN THE ONLINE VERSION OF THIS ISSUE.**



# JACC

## Cardiovascular Interventions

---

### CONTENTS

JANUARY 25, 2016 VOLUME 9, NUMBER 2

---

#### LETTERS TO THE EDITOR

Adenosine-Dependent Vasodilation and the Quest for "Maximal" Hyperemia: Does Flow Provide an Answer? **200**

Tim P. van de Hoef, Javier Escaned, Jan J. Piek

3-Year Outcomes of the OLIVE Registry, a Prospective Multicenter Study of Patients With Critical Limb Ischemia **201**

Femi Philip

#### Reply

Osamu Iida, Masato Nakamura

---

#### EDITOR'S PAGE

"Real-World Evidence?" Get Real! **204**

Spencer B. King III